amendments and arguments.

The Examiner has set forth numerous new grounds of objection and rejection. First, the Examiner has objected to claims 1, 7, 10, and 11 for containing minor informalities.

Second, the Examiner has maintained the rejection of claims 1, 4, 5, 7, 10-13, 15 and 16 under 35 U.S.C. §112, second paragraph for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 4, 5, 7, 10-13, 15 and 16 remain rejected under 35 U.S.C. §112, first paragraph as allegedly not described in the specification in a way such as to reasonably convey that the inventors had possession of the claimed invention. The Examiner states that Genbank Accession No. D61377 has been changed since the filing of the instant application, and could be changed again. The Examiner suggests that the sequence of GenBank Accession No. D61377 be submitted in a sequence listing.

Claims 1, 4, 5, 7, 10-13, 15 and 16 are further rejected under 35 U.S.C. §112, first paragraph as allegedly lacking enablement.

At page 10 of the Official Action, the Examiner has maintained the rejection of claims 1, 4, 5, 7, 10-13, 15, and 16 under 35 U.S.C. §103(a) as being unpatentable over Seo et al. in view of Sanger et al., Gatz et al., Enyedi et al., Yu et al., and He et al.

The foregoing constitutes the entirety of the objections and rejections raised in the October 9, 2002 Official Action. In light of the present claim amendments and the following remarks, each of the above-noted rejections under 35 U.S.C. §§ 112, first and second paragraphs, and 103 is respectfully traversed.

SEQUENCE LISTING

A paper copy of the amended sequence listing in

compliance with 37 C.F.R. §§1.821-1.825 is being submitted herewith providing sequence information for the GenBank accesssion number which corresponds to the WIPK sequence referred to throughout the specification. This sequence listing is also being submitted in both paper copy and computer readable form under a separate cover in order to facilitate entry of the same into the application.

The sequences referred to herein as SEQ ID NO:1 and 2 are identical to the Genbank entry D61377 as of the filing date of this application. This statement provides the requisite evidence to support entry of the sequence into the application (see MPEP 608.01(p), which discusses the incorporation of essential material into the specification).

Accordingly, entry of the sequence listing is respectfully requested.

THE OBJECTIONS TO PENDING CLAIMS 1, 7, AND 10 HAVE BEEN OVERCOME

Claims 1 and 10 are objected to for containing mispellings. These misspellings have been corrected in accordance with the present amendment.

In claim 7, the Examiner has suggested that the recitation "which" be replaced with "wherein said transgenic plant". Applicants respectfully submit that the recitation of "which" in the claim is clear and thus the claim is proper in its originally filed form. No reasoning is provided as to why the claim is objectionable. Nonetheless, in the interest of expediting prosecution, and without acquiescing to the Examiner's objection, the claim has been amended as suggested by the Examiner.

The foregoing amendments and the previous cancellation of claim 11 in the last office action renders each of the above-noted objections to the claims moot.

CLAIMS 1, 4, 5, 7, 10, 13, 15, AND 16 AS AMENDED FULLY COMPLY

WITH THE DEFINITENESS REQUIREMENTS OF 35 U.S.C. §112, SECOND PARAGRAPH

The Examiner has maintained the rejection of claims 1, 4, 5, 7, 10, 13, 15 and 16 under 35 U.S.C. §112, second paragraph for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

At the outset, it is noted that the relevant inquiry in determining whether a given claim satisfies the requirements of 35 U.S.C. §112, second paragraph, is whether the claim sets out and circumscribes a particular area with a reasonable degree of precision and particularity such that the metes and bounds of the claimed invention are reasonably clear. In re Moore, 169 U.S.P.Q. 236 (C.C.P.A. 1971).

With regard to the rejection of claims 1 and 10, the Examiner notes that the claims were previously amended to recite that the transgenic plant is stably transformed with a construct comprising a molecule selected from the group consisting of GenBank Accession No. D61377 or a sequence having 90% sequence identity therewith encoding a WIPK enzyme. The Examiner still objects to the use of the acronym WIPK, because it has another meaning in the art, which the Examiner feels is confusing. Further, the Examiner has suggested language which removes the recitations of "WIPK". Additionally, the Examiner notes that Genbank Accession No. D61377 has changed since the filing of the instant application, and thus suggests applicants submit the sequence in a sequence listing, and refer to it in the claims by the assigned sequence identifier.

The Examiner's requirement that the WIPK acronym be changed due to its allegedly uncertain meaning is respectfully traversed. A great deal of latitude is extended to applicant with regard to the terminology used in the claims. See MPEP 2173.05(b) "...consistent with the well-established axiom in patent law that a patentee is free to be his or her own lexicographer, a patentee may use terms in a manner contrary

to, or inconsistent with one or more of their ordinary meanings. *Hormone Research Foundation Inc. v. Genentech Inc.*, 904 F.2d 1558 15 USPQ2d 1039 (Federal Circuit 1990).

Accordingly, Applicant's submit that the recitation of WIPK is clear to the skilled artisan. Seo et al. described the protein of SEQ ID NO:2 as WIPK and the inclusion of a specific SEQ ID NO: readily apprises the skilled person of the metes and bounds of the claim. Nevertheless, in the interest of expediting prosecution, and without acquiescing to the Examiner's rejection, applicant's have amended the claims in accordance with the Examiner's helpful suggestions.

In response to the Examiner's concerns regarding the Genbank Accession number, applicants have amended the claims to recite a sequence identifier, and further submit herewith, a sequence listing which corresponds to the sequence set forth in Genbank Accession No. D61377 at the time the application was filed. Accordingly, the claims now explicitly recite the sequence of the claimed invention, thereby removing any perceived uncertainty.

The Examiner has also rejected claim 4 for allegedly lacking antecedent basis in the recitation of "the DNA construct". This phrase has been eliminated from the claim obviating this rejection.

The Examiner has also rejected claims 4, 5 and 12 because they are allegedly broader in scope then their parent claims. Claim 4 has been amended such that it is now independent. The amendment to claim 4 renders the rejection to claim 5 moot. Claim 12 has been canceled and new claims 18 and 19 added which find support in claims 12 and 10 as originally filed.

In view of the claim amendments presented herewith, Applicants respectfully submit that one of skill in the art would be readily appraised of the metes and bounds of the claims. Accordingly, the rejection of pending claims 1, 4, 5, 7, 10, 13, 15 and 16 as amended under 35 U.S.C. §112, second paragraph, is no longer appropriate and should be withdrawn.

CLAIMS 1, 4, 5, 7, 10, 13, 15, AND 16 AS AMENDED ARE FULLY DESCRIBED BY THE DISCLOSURE IN THE SPECIFICATION

The Examiner has maintained the rejection of claims 1, 4, 5, 7, 10, 13, 15 and 16 under 35 U.S.C. §112, first paragraph as allegedly not described in the specification in such a way as to reasonably convey that the inventors had possession of the claimed invention at the time the application was filed. The Examiner's objection pertains to the recitation of Genbank Accession No. D61377, since this Genbank entry has allegedly been changed since the filing of the instant application. The Examiner suggests that the sequence of GenBank Accession No. D61377 be submitted in a sequence listing, with evidence that it was the sequence at the time of priority of the instant application.

As previously described, the sequence set forth in Genbank D61377 as of the filing date of the application has been submitted in connection with a sequence listing, with the evidence required for entry. Also, the claims have been amended to recite a sequence identifier in place of the previously included Genbank accession number.

In light of the foregoing claim amendments and remarks, Applicants respectfully submit that the claims as amended comply with the description requirements of 35 U.S.C. §112, first paragraph and request that the rejection of amended claims 1, 4, 5, 7, 10, 13, 15 and 16 be withdrawn.

CLAIMS 1, 4, 5, 7, 10, 13, 15, AND 16 AS AMENDED ARE FULLY ENABLED BY THE DISCLOSURE IN THE SPECIFICATION

The Examiner has rejected claims 1, 4, 5, 7, 10, 13, 15 and 16 under 35 U.S.C. §112, first paragraph as allegedly lacking enablement.

First, the Examiner again takes issue with the term "WIPK", noting that the nucleic acid recited in the instant claims (SEQ ID NO:1) is not necessarily wound induced, and

thus concludes that it would require undue experimentation to determine which WPIK's were in fact wound induced.

The claims have been amended to further clarify the invention. The nucleic acid encompassed by the claims is now referred to as SEQ ID NO:1. Accordingly, the alleged confusion with regard to the determination of which WIPK proteins meet the limitations of the claims has been eliminated. Further, it is a matter of routine experimentation to determine which other proteins are encoded by nucleic acid sequences which are 90% identical to SEQ ID NO: 1 and encode a functional kinase enzyme. The Examiner's attention is drawn to MPEP 2164.06, which discusses quantity of experimentation necessary with regard to enablement:

> The quantity of experimentation needed to be performed by one skilled in the art is only one factor involved in determining whether "undue experimentation" is required to make and use the invention. "[A]n extended period of experimentation may not be undue if the skilled artisan is given direction or guidance." In re Colianni, 561 F.2d 22, 224, 195 USPQ 150, 153 (CCPA 1977)"'The test is not merely quantitative, since a considerable amount of experimentation is permissible, if it is merely routine, or if the specification in question provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed.'" In re Wands, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir 1988) (citing In re Angstadt, 537 F.2d 489, 502-504, 190 USPQ 214, 217-219 (CCPA))

Also, in Example B, under the heading "SEVERAL DECISIONS RULING THE DISCLOSURE WAS ENABLING", MPEP 2406.6(b) cites a specific example of a biotechnology case in which a large amount of experimentation (likely far more than would be required in the instant case) was found **NOT** to be undue:

> (B) In re Wands, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir 1988), the court reversed the rejection for lack of enablement under 112 first paragraph, concluding that undue experimentation would not be required to practice the invention. The nature of monoclonal antibody technology is such that experiments first involve the entire attempt to make the monoclonal hybridomas to determine which ones secrete antibody with the desired characteristics. The court found that the specification provided considerable direction and

> guidance on how to practice the claimed invention and presented working examples, that all of the methods needed to practice the invention were well known, and that there was a high level of skill in the art at the time the application was filed. Furthermore, applicant carried out the entire procedure for making a monoclonal antibody against HbsAg three times and each time was successful in producing at least one antibody which fell within the scope of the claims.

Applicants respectfully submit that use of art standard techniques of conservative substitution, and corresponding screening for activity, both of which are very routine in the art of genetic engineering, would be sufficient to determine the functional kinase enzymes encompassed by the instant claims. Accordingly, the amended claims which specifically reference SEQ ID NO:1 and sequences which are 90% identical thereto are fully enabled by the specification.

Secondly, the Examiner has argued that although increase WIPK expression does upregulate certain pathogenesis related proteins and salicylic acid, these findings do not definitively indicate an increase in disease resistance. As support for this contention, the Examiner cites Zhang et al. (The Plant Cell, Vol. 13,1877-1889, 2001). According to the Examiner, Zhang et al. teaches transgenic plants in which overexpression of tobacco WIPK does not result in an increase in activation of WIPK. The Examiner thus concludes that undue experimentation would be required to make transgenic plants over expressing WIPK which confers enhanced resistance to the disease causing agents listed in the claims.

Applicants respectfully traverse. First, it is noted that Zhang et al. were concerned with assessing the effects of WIPK and SIPK overexpression on the activation of downstream genes. There is no teaching or suggestion that the activity of WIPK in the assay system of Zhang et al. is in any way indicative of it's overall role in the induction of multiple defense responses in higher plants. Indeed, Zhang et al. never assessed the transgenic plants generated for enhanced

disease resistance.

Zhang et al. disclose the analysis of the effect of overexpression of SIPK and/or WIPK in the presence of the MAPKK NtMEK2. Applicants note that NtMEK2 is just one of a plethora of MAPKK's which might activate WIPK. Further although Zhang et al. indicate that WIPK is overexpressed, but not activated in this particular system, Zhang et al. do not conclude, as the Examiner suggests, that WIPK is not a pathogen resistance protein. Instead, Zhang et al. conclude that WIPK is activated by a different MAPKK, or that there is an excess of WIPK phosphatase in the cells being assayed, which results in deactivation of all WIPK, including the exogenously expressed WIPK. Zhang et al. express no doubt that WIPK plays a role in pathogen resistance. For example, Zhang et al. explicitly discuss the combined role of WIPK and SIPK in pathogen resistance at page 1883. Thus, contrary to the Examiner's assertions, a close analysis of Zhang et al. indicates that WIPK is important for pathogen resistance. Moreover, the instant specification teaches that WIPK **is activated** in response to TMV infection (see page 31-32).

In conclusion, as set forth in the specification, and noted by the Examiner, overexpression of WIPK results in elevated levels of salicylic acid and other pathogenesis related proteins (see page 37 of the instant specification). Salicylic acid and other pathogenesis related proteins are known to confer pathogen resistance in plants. Further, as described above, the instant specification, and Zhang et al. teach that in view of WIPK overexpression in response to pathogen exposure, WIPK is likely to play additional roles in pathogen resistance. Lastly, WIPK is linked to SAR in the instant specification (see page 34, line 25-page 35).

In light of the foregoing claim amendments and remarks, Applicants respectfully submit that the claims as amended comply with all the requirements of 35 U.S.C. §112, first paragraph and request that the rejection under 35 U.S.C. §112,

first paragraph be withdrawn.

PENDING CLAIMS 1, 4, 5, 7, 10, 13, 15, and 16 AS AMENDED ARE NOT UNPATENTABLE OVER SEO ET AL IN VIEW OF SANGER ET AL, GATZ ET AL, ENYEDI ET AL, YU ET AL, AND HE ET AL

The Examiner has maintained the rejection of claims 1, 4, 5, 7, 10, 13, 15, and 16 under 35 U.S.C. 103(a) as being unpatentable over Seo et al. in view of Sanger et al., Gatz et al., Enyedi et al., Yu et al., and He et al.

The relevant inquiry in determining obviousness under 35 U.S.C. §103 based on the combined disclosure of references, is whether the references supply some teaching or suggestion to one of ordinary skill in the art to arrive at the invention as claimed. In re Dow Chemical Company, 5 U.S.P.Q.2d 1529 (Fed. Cir. 1988). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. In re Fine, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Moreover, the teaching or suggestion supporting the desirability or the combination must be found in the prior art, not in the applicant's disclosure. In re Fritch, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). Under these standards, none of the cited references, considered singly or in combination, renders obvious the claimed invention.

Seo et al. describe a newly isolated MAPK like protein designated WIPK which is induced after mechanical wounding. Seo et al. fail to teach the FMV promoter or an inducible promoter, and also are silent regarding disease resistance to the pathogens specified in the instant claims. Most importantly, Seo et al. do not suggest or teach that the WIPK protein is able to enhance pathogen resistance in higher plants.

The Examiner cites Sanger et al. for teaching an FMV promoter, and Gatz et al. for teaching an inducible promoter. The Examiner relies on Enyedi et al., Yu et al., and He et al.

for the teaching that HR responses are mounted in plants in response to the pathogens encompassed by the claims.

Applicants traverse. None of the references, alone or in combination, teach all of the features of the claims as presently amended. Further, contrary to the assertions of the Examiner, there is no motivation to combine the references to create transgenic plants having enhanced disease resistance. None of the above cited references address the explicitly recited feature of enhancing pathogen resistance. It is a well-settled premise in patent law that "silence in a reference is not a proper substitute for adequate disclosure of facts from which a conclusion of obviousness may justifiably follow". In re Burt, 148 U.S.P.Q. 548 (CCPA 1966) Seo et al. teach that the protein of SEQ ID NO:1 is a wound induced protein kinase and are silent as to whether the enzyme is pathogen induced. Indeed, Seo et al. fail to appreciate that overexpression of WIPK will enhance pathogen resistance. Further, none of the secondary references relied on by the Examiner correct this deficiency. Accordingly, the cited references as combined fail to teach or suggest the invention as presently claimed.

The Examiner also states that since the wounded plants of Seo et al. have increased salicylic acid expression, one skilled in the art would know that they have enhanced pathogen resistance as a result. However the claims are all drawn to overexpression of WIPK to induce enhanced disease resistance. While Seo et al. teaches that **wounding** induces salicylic acid expression, it does not teach or suggest that **WIPK** induces the enhanced salicylic acid expression, or that WIPK provides enhanced pathogen resistance. Thus because Seo et al. do not recognize the link between WIPK expression and enhanced pathogen resistance, there is no motivation to overexpress WIPK to induce pathogen resistance. Accordingly, there is no motivation to make the substitutions suggested by the secondary references to produce plants having enhanced

pathogen resistance.

In light of all the foregoing, Applicants respectfully submit that the claims are patentable over Seo et al., in view of Sanger et al., Gatz et al., Enyedi et al., Yu et al, and He et al., and withdrawal of the rejection under 35 U.S.C. 103 is respectfully requested.

CONCLUSION

In view of the amendments and remarks presented herein, it is respectfully urged that the rejections set forth in the October 9, 2002 Official Action be withdrawn and that this application be passed to issue. In the event the Examiner is not persuaded as to the allowability of any claim, and it appears that any outstanding issues may be resolved through a telephone interview, the Examiner is requested to telephone the undersigned attorney at the phone number given below.

Respectfully submitted,

DANN, DORFMAN, HERRELL AND SKILLMAN
A Professional Corporation

By _____
Kathleen D. Rigaut, Ph.D., J.D.
PTO Registration No. 43,047

Telephone: (215) 563-4100
Facsimile: (215) 563-4044

Enclosures: Appendix A - Marked Up Copy of Claims

Appendix A

Marked up Copy of Claim Amendments

1. (Twice Amended) A transgenic plant expressing an N gene, having enhanced resistance to a plant disease-causing agent selected from the group consisting of tobamoviruses, elicitin-producing fungi, parasiticein-producing fungi, [cyrptogein] cryptogein-producing fungi, harpin-producing bacteria, tobacco mosaic virus and Phytophthora fungi; wherein said transgenic plant is stably transformed with a nucleic acid construct comprising the figwort mosaic virus 35S promoter operably linked to a nucleic acid molecule selected from the group consisting of a sequence set forth in [GenBank Accession No. D61377] SEQ ID NO:1 or a sequence having 90% sequence identity therewith encoding a functional [WIPK] kinase enzyme, said nucleic acid molecule being expressible in a plant cell.

4. (Amended) [The transgenic plant of claim 1, wherein the DNA construct comprises a WIPK-encoding region operably linked to] A transgenic plant expressing an N gene, having enhanced resistance to a plant disease-causing agent selected from the group consisting of tobamoviruses, elicitin-producing fungi, parasiticein-producing fungi, cryptogein-producing fungi, harpin-producing bacteria, tobacco mosaic virus and Phytophthora fungi; wherein said transgenic plant is stably transformed with a nucleic acid construct comprising an inducible promoter operably linked to a nucleic acid molecule selected from the group consisting of a sequence set forth in SEQ ID NO:1 or a sequence having 90% sequence identity therewith encoding a functional kinase enzyme, said nucleic acid molecule being expressible in a plant cell.

7. (Amended) The transgenic plant of claim 1, [which] wherein said transgenic plant has enhanced resistance to the tobacco mosaic virus.

10. (Twice Amended) A method of making a transgenic plant expressing the N gene, having enhanced disease resistance comprising:

a) transforming regenerable cells of a plant with a recombinant DNA construct comprising a figwort mosaic virus 35S promoter operably linked to a nucleic acid molecule selected from the group consisting of a sequence set forth in [GenBank Accession No. D61377] SEQ ID NO:1 or a sequence having 90% sequence identity therewith encoding a functional [WIPK] kinase enzyme, expressible in a plant; and

b) regenerating a transgenic plant from said transformed regenerable cells, said transgenic plant having enhanced disease resistance to a plant disease-causing agent selected from the group consisting of, tobamoviruses, elicitin-producing fungi, parasiticein-producing fungi, [cyrptogein] cryptogein-producing fungi, harpin-producing bacteria, tobacco mosaic virus and Phytophthora fungi.

12. Canceled.

13. (Amended) The method of claim 10, wherein the [DNA construct comprises a tobacco WIPK coding sequence] nucleic acid molecule is from tobacco.